

## REMARKS

### I. Front Page of Office Action and Claim Status

The front page of the July 13, 2003 office action indicates that Claims 1-8 are pending and that Claims 1-8 are rejected.

### II. Claim Status

Claim 1 is the only independent claim. Claims 1-3 and 5-8 are amended. Claim 9 is added. Claim 4 is cancelled. The specification as originally filed fully supports amended claims 1-3 and 5-8 and new claim 9. Therefore, no new matter has been added.

### III. The Rejection of Claim 3 under 35 USC 112 Second Paragraph is Improper and Should be Reversed

The examiner objects to claim 3 under 35 USC 112 second paragraph stating that:

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear what the word "interdigitated" means because it is not defined in the specification. For the above reason, claim 3 has not been treated on its merits. [Office action mailed December 30, 2004 page 2 item 1.]

In response, the applicant agrees that the specification contains no antecedent for the term "interdigitated." However, the applicant submits that the examiner's rejection of claim 3 as indefinite is improper and should be reversed. This is because the word "interdigitating" (1) is well known and (2) has a well known specific meaning in this art, for example, as defined in "The Free Online Dictionary." This dictionary defines the term "interdigitate" as "to interlock, as the fingers of two hands that are joined; to be interwoven; to commingle." This definition is available at <http://www.thefreedictionary.com/interdigitates>. See attachment 1. Therefore, when construing the term "interdigitate" in the context of its ordinary and customary meaning, the term

"interdigitate" as used in claim 3, refers to the interlocking aspect of the first and second surface elements.

Furthermore, the term "interdigitate" has been routinely and commonly used in the electronic art and refers to the interlocking aspect of two surfaces such as electrodes. For example, US Patent 6,979,883 to Spampinato describes "interdigitated" as "a geometric shape called "interdigitated" wherein the emitter region extends as a comb having elongated portions (fingers) inside the base region..." US Patent 6,979,883. Thus, the dictionary meaning is consistent with the meaning of "interdigitate" as used in the electronic art as in US Patent 6,979,883. Figure 1 in the specification shows that the security element color imprint 1 interdigitated with security element OVD 2. Accordingly, the term "interdigitate" as used in claim 3 has similar meaning as used in the specification of US Patent 6,979,883. Therefore, as recited in claim 3, the term "interdigitate" does not require an antecedent definition in the specification because it's meaning is not ambiguous or indefinite. Accordingly, the applicant respectfully requests that the rejection of claim 3 is improper and should withdrawn.

#### **IV. The Rejections of Claims 1, 4 and 5 Under 35 USC 102 (b) as Being Anticipated by Tureck et al. (US 4,303,307) are Improper and Should be Reversed**

##### **A. The Rejection of Claim 1**

The examiner rejected claims 1, 4, and 5 under 35 USC 102 (b) as being unpatentable over Tureck et al., (US 4,303,307) hereinafter ("Tureck") stating that:

Claims 1, 4, 5 rejected under 35 U.S.C. 102(b) as being anticipated by Tureck et al (US\_4,303,307).

With regard to claims 1 and 5, Tureck et al (Tureck hereinafter) discloses a security element disposed in a web surface, comprising: at least one first surface element of electrically conductive and nonconductive sections (see col.3, lines 19-24) and at least one second surface element of optical diffraction (see col.5, lines 24-44 and specifically line 43).

With regard to claim 4, Tureck teaches that the electrically conductive sections are

disposed in the web surface on different planes thereof (see Tureck Figure 3, col.5, lines 51-55). [Office action mailed December 30 2004 page 2 items 3-6.]

In response, the applicant respectfully traverses the rejection of claim 1 because Tureck does not disclose the sequence forming a diffraction array as defined by amended claim 1. Claim 1 as amended recites a security element disposed in a web surface, comprising a first surface element, said first surface element including (1) electrically conductive sections and (2) electrically nonconductive sections; wherein said electrically conductive sections and said electrically sections are parallel with one another; a second surface element, including a sequence of (1) striped metallized zones and (2) striped de-metallized zones; wherein said striped de-metallized zones alternate in said sequence with said metallized zones; wherein said striped de-metallized zones extend parallel to said metallized zones; and wherein said metallized zones and de-metallized zones have thickness producing for diffraction of optical wavelengths.

Figure 1 provides an example of claim 1. Figure 1 shows a document with an electrically conductive color imprint **1** and an optically variable device (OVD) **2**. See page 14 lines 1-12 of the specification. The specification discloses that figure 1 shows a security element. The security element includes (1) a first surface element that comprises an electrically conductive color imprint **1** provided with parallel conductive striped zones **3** alternating with insulating striped zones **4**; and (2) a second surface element that comprises the OVD **2**. This OVD **2** consists of a metal layer **5** striped demetallized zones **6**, and demetallized zones **7**. The first and second surface element recited in claim 1 reads on the first and second surface elements of figure 1.

The following passage in the specification discloses how OVDs are used stating that:

"[t]he authenticity of documents incorporating optically diffractive security elements has usually been checked by complex optical test procedures. For instance, testing of documents incorporating an optically diffractive security element or so-called OVD (optically variable device) has been impossible within document handling machines in view of their high running speeds. German patent specification 27 47 156 discloses a method and a test instrument for testing for counterfeits of holographically secured

identity cards. The OVD is reproduced and then visually examined. Such a procedure is unsuited for fast, efficient and automated tests.” [Specification at page 1 lines 16-24.]

The following passage in the specification explains that an OVD provides optical diffraction stating that:

“[i]n accordance with the invention the function design may be a security element which may be effective by optical diffraction or may consist of electrically conductive dyes or inks. In case it is structured as an optical diffraction security element it may be identically to the optical, i.e., visually discernible, design and even support it in its optical design. It is possible to sputter the demetallized or non-metallized zones in order to increase its brilliancy.” [Page 6 lines 25 through page 7 lines 2.]

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“[T]o test the authenticity of documents with optical diffraction security elements, the electrical conductivity of discontinuous metallizing layers or partially metallized layers or zones of metallized layers in different planes is evaluated by capacitive coupling.” [Page 8 lines 2-5.]

Optical diffraction by parallel lines requires a line spacing on the order of the wavelength of light. Therefore, the line spacing of the OVD is necessarily small.

#### B. **Claim 1**

Claim 1 as amended defines both the first and second elements (including conductive color imprints in the first element and the OVD in the second element).

#### C. **Tureck**

Tureck is directed to a copy resistant security system that comprises a means for diverting the transmission of reflected light away from the receiving elements. See Tureck Abstract. In

particular, Tureck discloses a dielectric layer formed of an electrically non-conductive material that is embedded with electrically conducting spherical particles within the dielectric layer. *Id.* These spherical particles operate by forwardly scattering the light and diverting the transmission of reflected light away from receiving elements. *Id.* The relevant sections in Tureck cited by the examiner states that:

“[I]n one illustrative embodiment of the invention, the document includes a supporting substrate including a dielectric layer formed of an electrically non-conducting material. A plurality of generally spherical particles are formed of an electrically conducting material and are embedded within the dielectric layer. The particles are operable to forwardly scatter the light and divert the transmission of substantially all of the reflected light away from the receiving elements.” [Tureck column 3 lines 21-27.]

\* \* \*

Use of diffusing elements is well-known in the field of optics for the purpose of resolving scattered or reflected light. A preferred embodiment of the above-described document utilizes a blue dielectric backing which enhances the scattering effect. The spacing and size of the spheres is dictated by the longest wavelength present in the visible light spectrum, namely, seven thousand angstroms. Generally speaking, as the size of the spheres is increased, the scattering effect is heightened; such considerations as the thickness of dielectric to be used and the difficulty of maintaining the spheres within the dielectric provide more realistic economic and functional parameters. It should be plain, however, that any such document construction may be tailored to the expected requirements of wavelength, intensity, size of print of other indicia, and other individual characteristics of the original sought to be protected. While use of aluminum and copper spheres have been preferred, it should also be noted that use of glass beads provides added light-scattering effect through internal reflection, diffraction and refraction.”

[Tureck column 5 lines 24-44.]

The foregoing passage shows that Tureck discloses glass spherical beads to scatter light. Further, Tureck column 4 lines 60-62 states that the spheres must be made of conductive material, while the dielectric medium must be made of non-conductive material.

Moreover, the security element of Tureck comprises only one surface element- a dielectric layer with spherical beads embedded inside it.

#### **D. Comparing Tureck to Claim 1**

In contrast, claim 1 recites a first and second surface elements that are placed in different regions on the web surface (document). Tureck does not disclose first and second surface elements.

Moreover, claim 1's second element is structured as a diffraction grating with extended parallel regions; an OVD. Extended parallel regions are not disclosed by Tureck. Furthermore, an OVD comprises metallized and demetallized sections. Metallized means deposited and forming a layer. Tureck discloses no metallized regions structured as a diffraction grating. Accordingly, the rejection of amended claim 1 is improper and should be withdrawn.

#### **E. The Rejection of Claim 5**

The rejection of dependent claim 5 is improper for the same reasons applicable to claim 1.

### **V. The Rejections of Claims 2 and 6-8 Under 35 USC 103 (a) as Being Unpatentable Over Tureck et al. (US 4,303,307) in View of Irwin, Jr. et al. (US 5,818,019) is Improper Because There is No Motivation to Combine Tureck and Irwin and The Proposed Combination is Not What is Claimed**

The examiner rejects claims 2 and 6-8 under 35 USC 103 (a) as being unpatentable over Tureck et al. (US 4,303,307) in view of Irwin, Jr. et al. (US 5,818,019) hereinafter (“Irwin”) stating that:

#### **A. With regard to claims 2 and 6-8, Tureck teaches all claim limitations as disclosed**

above, except for the use of conductive ink and magnetically responsive elements disposed in a security element to prevent any fraud and for easy detection of security documents.

B. Irwin, Jr. et al (Irwin hereinafter) teaches the use of electrically conductive ink (see abstract, col.3, line 26), and magnetically responsive included in a security substrate (col.2, lines 33-40) to prevent any fraud and for easy detection of security documents. Irwin also teaches of semi-conductive ink (see abstract) which indicates that the conductivity of the security element is different from normally conductive elements.

C. In view of Irwin's teachings, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the use of conductive ink and magnetically responsive elements into any security element due to the fact that such a combination would provide additional security to prevent any fraud and for easy detection of any security documents. [Office action mailed December 30, 2004 page 3 item 8.]

#### A. Overview of Irwin

Irwin relates to an electronic apparatus directed to the determination of the authenticity and integrity of various types of documents such as lottery tickets. See abstract in Irwin. Irwin accomplishes this objective by using an electronic validation machine to compare data contained in electronic circuits printed on the document. The method includes printing a portion of an electrical circuit on the document or applying a material having electrical conductive properties on the document. Irwin column 5 lines 61-65. Further, Irwin teaches that "the circuits are printed in conductive or semiconductive ink using, for example, a gravure printing process. When the authenticity of the document is to be determined, an external verification machine is used to detect the presence and status of the circuit. Any attempted tampering or alteration of the printed document causes detectable changes in the characteristics of the circuit." Irwin column 3 lines 41-46. Thus, Irwin is directed to storing machine readable data in a circuit embedded in a document having human readable data, so that a machine can check the human readable data to prevent fraud. Further, Irwin fails to disclose striped metallized and de-metallized zones forming a diffraction array, as defined by claim 1.

## **B. Overview of Tureck**

As discussed *supra* in section III, Tureck is directed to providing a document with small spherical reflective beads to break up light to preclude duplication of documents on standard electrostatic copiers. See Tureck abstract. The security feature in the document includes a dielectric layer formed of an electrically non-conducting material wherein a plurality of generally spherical particles of an electrically conducting material are embedded inside the dielectric layer. Tureck column 3 lines 21-24. Therefore, Tureck is concerned with preventing photolithographic reproduction of documents.

## **C. Combination of Tureck and Irwin**

### **1. No motivation to combine Tureck and Irwin**

Irwin is concerned with electronic verification cross check to verify human readable data in a documents. This is accomplished by printing an electrical circuit onto the document in conductive or semiconductive ink using, for example, gravure printing process. Irwin column 3 lines 41-43. Therefore, there appears to be no reasonable motivation for modifying Tureck to include an electronic circuit storing machine readable data, since Tureck is not directed to a system where fraudulent modification of the human readable data is a concern.

In addition, including Tureck's conductive particles on the same medium as Irwin's electronic circuit would open the possibility of shorting the circuit, and therefore lead to unreliability.

### **2. Proposed combination is not subject matter defined by amended Claim 1**

The proposed combination does not include striped metallized and demetallized zones forming a diffraction array. Moreover, the proposed combination lacks the claimed first and second elements. Therefore, the applicant submits that the rejection of dependent claims 2 and 6-8 as obvious over Tureck in view of Irwin is improper and should be withdrawn.

#### **D. The Rejection of Claim 2**

The applicant submits that it would not have been obvious to make electrically conductive sections of different conductivities. Tureck does not disclose electrically conductive surface sections of different conductivities. Instead, Tureck discloses generally reflective spherical particles formed of an electrically conducting material embedded within a dielectric layer. Also, Tureck does not teach that the spherical particles be of different conductivities.

Neither does Irwin. Irwin discloses that the upper portion of the ticket having the pull tabs also includes a layer of conductive ink. Irwin column 3 lines 25-26. Further, Irwin neither teaches surface element of electrically conductive sections with parallel non-conductive sections nor does Irwin teach that the conductive sections be of different conductivities. Also, Irwin does not teach a striped metallized and de-metallized zones forming a diffraction array, as defined by claim 1. Therefore, the examiner has not presented a *prima facie* case of obviousness. The applicant respectfully requests that the rejections of dependent claim 2 is improper and should be withdrawn.

#### **E. The Rejection of Claims 6 and 7**

With respect to claims 6 and 7, the applicant submits that it would not have been obvious to create a security element wherein the electrically conductive sections are made of electrically conductive ink and wherein the electrically non-conductive sections are made of ink visually indistinguishable from the electrically conductive ink.

Tureck is concerned with a method to prevent the unauthorized copying of documents by controlling reproduction. This method involves reflecting light away from the receiving elements by incorporating spherical particles or metallized film that forwardly scatter the light and divert the transmission of substantially all of the reflected light away from the receiving elements.

Irwin is concerned with determining the authenticity and integrity of various types of documents such as lottery tickets by using a printed circuit element into the document. The electronic circuits are printed on the document in conductive or semiconductive ink and are embedded into the document. Irwin is concerned with added security to human readable data on

the document and is not directed to codifying documents using security elements through optical diffraction or through the uses of dyes.

In contrast, this application is directed to a novel method of using security elements and devices which significantly complicate or even render it impossible for a counterfeiter to draw conclusions on the basis of functioning of test methods and devices. To that end, the electrically conductive ink through their different colors and/or different dye thicknesses provide codes and increase the safety against counterfeiting. See specification on page 7 lines 22-28.

There is no motivation in Irwin to modify Tureck to include claim 6's recitation of electrically conductive sections made of electrically conductive ink. Neither is there a motivation in Irwin to modify Tureck to include claim 7's recitation of electrically non-conductive sections made of ink visually indistinguishable from electrically conductive ink, because Tureck is not concerned with fraudulent modification of the human readable data of Irwin.

Further, the combination of Irwin and Tureck do not produce striped metallized and de-metallized zones producing a diffraction grating. Therefore, the applicant submits that the rejection of dependent claims 6 and 7 as obvious over Tureck in view of Irwin are improper and should be withdrawn.

#### **F. The Rejection of Claim 8**

For the same reasons just presented, the applicant submits that it would not have been obvious to create a security element wherein at least one of the conductive, non-conductive and optical diffraction surface elements is magnetically responsive. Therefore, the applicant submits that the rejection of dependent claim 8 as obvious over Tureck in view of Irwin is improper and should be withdrawn.

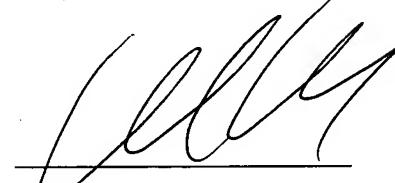
V. **Closure**

This application should now be in condition for allowance. Should the examiner have any questions, he is urged to contact the undersigned at 703-415-0012.

Respectfully Submitted,

11/11/06

Date



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December 26, 2005 (2:24pm)

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## In`ter`dig`it`ate

v. t. 1. To interweave.

v. i. 1. To interlock, as the fingers of two hands that are joined; to be interwoven; to commingle.

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ATTACHMENT 1